

Bear Conservation and Research at Washington State University

JOY ERLNBACH: Hi. My name is Joy Erlenbach, and we're at the WSU Bear Center. And I wanted to introduce you to the bears today. So behind me there's four bears. Hopefully-- we're standing here because we want them to get into the pool. We thought that would be some fun footage. But it's going to be on their schedule, so maybe we'll get lucky.

But we have four bears and they're all siblings. This is Zuri. We'll see if we can-- I have raspberries. I'm trying to entice them with the raspberry. But these guys are four. And they were actually hand-raised here. So these guys are really fun.

We'll see if one will take a raspberry for me. So this looks like Dodge. Yeah. So this looks like Dodge. And they can actually be really sweet, so when they grab the raspberries they just grab them really gently. It's kind of fun.

And so they've been here their whole life. We have bears that were hand-raised and born here, like these guys, and then we have other bears that came from the wild.

He wants more. See, now I've started this, and it's going to be hard to stop. So we have 11 bears currently. And of those, four came from the wild, and the rest were hand-raised here.

So they all have names. We have Zuri, Willow, and then Dodge, and Adak. And then we have some other bears that you won't be able to see right now. But we do rotate bears into the field throughout the day.

So we have three rotations of bears. We have our adult females that go out into the yard for a couple of hours each day, and then our adult males who go out at a separate time, and then these younger bears that go out by themselves. It's kind of like a playground, you have to keep the older kids from the younger kids. It's just safer that way.

So the Bear Center started in 1986, so it's been around quite a while. And it was started with the idea of conservation. So in 1975, grizzly bears in the lower 48 were listed on the endangered species list as a threatened species. And so there was this need for research related to conservation.

And so the Center helps do some of that research that has helped us better understand bears and conserve their wild populations. The Center is pretty unique. It's the only bear research facility in the US, and maybe even the world, that houses adult grizzly bears for research. So even though zoos have bears--

Hi. So this is Zuri. This is Zuri and we'll get her some raspberries. She is one of my favorite bears because she loves the water. So we were actually hoping she'd be in the pool. She also loves raspberries and scratching. Here you go.

The other thing is you can't just give one bear berries, because then they'll start a fight. So you have to go between them. OK. So Adak and Dodge, they're having some fun. We'll save one for Willow.

Anyway, one of my favorite things about these guys is their personalities. And so you can see the male personalities here. But Zuri, like I was mentioning, really loves the water. And so anytime there's a pool full of fresh water, she'll usually be in it. Maybe I'll stand in front of them.

But she also loves to do this thing, if we have a traffic cone, you know those big, orange, cylindrical traffic cones, she has been known to stick her head into one and then stand up with it on her head, kind of like a unicorn. So I like to say, she has the most personality of all the bears. And that's one of the best things about working here.

Oh, we might be getting lucky. Nope. We'll see if he goes in the pool. They don't always get along.

But like I was saying, one of the best things about working here is getting to know the bear's personalities. So this is one of our males that just got in the pool. And Zuri is in the back. And we'll see how they get along.

Yeah, so these guys are about 400-- the males are over 400 pounds right now and the females are more in the 300 pound range, which is kind of large for a four-year-old bear. But they are here at the Bear Center and they get plenty of food and they're really healthy.

One of the fun things to do is to stand here and watch them, obviously, if you're outside in the parking lot. But you do have to be careful because if they're feeling rambunctious, they'll start splashing in the pool and they'll splash people that are standing out there with all sorts of bear water. So it's really fun to see, but you do occasionally get wet when you don't expect it. So this is amazing, they're all getting along really well.

But like I was saying, their personalities are really fun. And each bear has a unique personality. We have two adult males that are brothers and they're really different from each other. One of them, Frank, is a more active bear. And then his brother John, even though they were from the same mother, his brother John is very, very, very laid-back and spends all of his time napping.

We have some bears that love the water. And we actually spray out their pens multiple times a day with a hose. And some bears will come up to the hose and just want to be sprayed, and they'll play in the water. And other bears will just avoid it. So it's really fun getting to know each of them.

And I've been here about 10 years. So I actually started as an undergrad, and then did my masters with the bears. And now I'm working on my PhD. So some of the work I do is here with the bears at the Bear Center, and some of it is actually in Alaska. And I'll try and talk about both of those.

So like I was saying about the Bear Center, we started in 1986. We've been around for a while. What we do is pretty unique because there aren't other centers like this. A lot of the research we do can't be done in the wild, and so the things that we do here have, sort of, formed the basis of a lot of the understanding of bear ecology that we have throughout the world.

So we can develop methods here-- we can develop methods here that researchers can take into the wild and apply to conservation there. So some of the examples of that are-- on wild berries, you might want to know how much energy they expend. And one of the ways you can do that is by placing an activity sensor on them. It's kind of like a Fitbit.

But to interpret the readings from that activity sensor, you have to actually observe the bears and validate that. And so we're able to do those things here. We can put an activity sensor on a bear here and record its behavior. And then a researcher could take a different activity sensor, put it on a bear in the wild, and then interpret that behavior, because we know what the readings mean from what we observed here.

We've also been able to do stable isotope studies. So stable isotopes exist naturally of carbon and nitrogen. They exist naturally out in the world. And we can actually track what a bear has eaten by measuring those levels of stable isotopes in their blood and in their hair. But you can't do that unless you have a certain correction factor. And we were able to feed bears here a known diet and measure that correction factor so that researchers across the globe can then collect hair and blood and estimate what that bear has eaten.

We've also been able to develop methods here of how to measure body fat in a bear. So body fat is a really important indicator of health of bears. Basically the fatter bear, the healthier bear, the better that female's cubs will survive. And so we were able to measure bears here and their body fat, and then bear researchers out in the wild can use a bioelectrical impedance analysis measure in the field and then know the body fat of that bear. It's been really valuable for conservation.

They're being so good. I'm pretty shocked. They don't always get along this well. Let's see, so do we have any questions yet that would be super good? I can keep rambling, but--

So what is the most interesting thing that you have learned while working with the bears?

Yeah. Well, of course, I love all of the different physiological adaptations that bears have. So bears hibernate, obviously. And so, sort of, the seasonal schedule of a bear is they will go into hibernation around October, November, and then spend five or six months hibernating, and then come out around April.

And so they don't eat, they don't drink, they don't urinate, they don't defecate for five or six months. They decrease their metabolism a whole bunch in order to allow them to do that. But it also means that they have to get all of the nutrition, all of the calories that they need, for five or six months of not eating. They have to get that in the other five or six months. And so they have a pretty limited time that they can get the calories they need.

And so I did a feeding study where we were looking at the ideal diet for a bear. And that also allowed us to look at how many calories in a day could a bear eat. And so I'm finally getting to your question. Is that we measured that some of our females that are maybe 300 to 400 pounds, whereas you or I might eat 2000 calories in a day, they were eating over 50,000 calories in a day. And that's just a smallish female.

And so the capacity of these bears to eat is astronomical. I tried to calculate it out, and that was the equivalent of something like over 19 large pepperoni pizzas in a day. So it's crazy. That's one of my favorite little bear facts.

And how do you observe the bears safely? What kind of risk precautions do you guys take here?

Yeah. So we have a lot of safety measures. So these bears, especially the ones that were hand-raised, are pretty comfortable around people. But they're still bears, and so we have a really healthy respect for them. And so when we're working around the bears, we usually have a fence separating us from the bears, or some sort of bars or something.

We also carry bear spray. And we also communicate really well with the people we're working with to check and make sure that if we're letting a bear out into an area, that there are no people there, that it's adequately closed, that all the gates are locked like they should be. And sort of the other thing is just making sure you're in the right mindset. You have to be aware of what's around you and just being careful.

So I guess I'll just talk about a few more of the studies that we've done here, just because I think they're super interesting. So we've done a lot of stuff related to conservation. And so some of that research has looked at, like I noted before, what's the ideal diet for a bear?

And so we've done macronutrient mixing trials, where we looked at how much protein, carbohydrates, and fat a bear would ideally eat, and how the ratios of those macronutrients contribute to weight gain. And so we were actually able to look at that and see that bears eat around 20% protein. And in an ideal world, they'd like the rest to be fat, so like 80% fat.

And we actually measured the body mass, or the rate that they were able to gain mass on that diet, and other levels of protein, and that diet was actually the optimal. So they were choosing something that made sense and maximized their weight gain. So that was pretty cool.

We've also done foraging studies that have looked at the digestibility of different foods for bears. And part of that led us to understand that although bears can eat vegetation, they're

only digesting part of it. And so only small bears can really get enough energy from vegetation. And so that's allowed us to say that in ecosystems where bears might be losing things like, cutthroat trout or other meat resources, that it doesn't necessarily mean that they're going to be OK. Because they can't just always make up for it.

Large males, for example, can't get enough energy from plants alone in most cases. And so it's allowed us to say, like, hey, these certain areas and these certain food resources are really important for large animals, and also for polar bears, for example. So based on polar bear's body size, they're so large that it's pretty unlikely that they would be able to survive on vegetation or on a lot of other food resources.

So right now we're actually starting a study where we're going to be looking at how polar bears might be able to, or maybe won't be able to, survive on land. So I could talk about research all day. There's tons and tons of research.

But one of the other really important things we do here is education and conservation. Well, they're all gone now, but we did have people in the parking lot a little while ago. And we have people coming into the parking lot throughout the day. On the weekends it can be really, really busy.

And whenever we're here, we're able to talk to them, and we get a lot of questions about bears. And so we're able to answer a lot of questions. We're able to teach people about bears. And for conservation in the future, we have not just expanding human populations, we also have expanding bear populations.

So like in the Yellowstone ecosystem, for example, bears are expanding into areas that they haven't been in a really long time, which could lead to conflict with people. And so one of the greatest ways to reduce conflict, one of the keys for conservation, is going to be dispelling the myths about bears, increasing tolerance, increasing people's willingness to adapt, and to maybe make sure that their garbage is in a bear-safe container or something like that.

And so we're able to dispel some of those myths here. And we also have volunteers that help us in the mornings, feed and clean the bears. And so we're able to-- over 33 years that the Center has been going, we've had a lot of volunteers that have gone out into the world. And those volunteers are also able to help, sort of, change the narrative on bears from one that's been historically pretty negative, if you look at how bears are portrayed in the media.

After working here, you get a better understanding that bears aren't always out to get you. They're quite forgiving. And they all have personalities. And they become a little less frightening the more you get to know them. And so our volunteers also get to go out and tell that story. And I see that, personally, as a huge asset.

So if there are people in the Pullman, Moscow area that do want to volunteer, where do they go or who do they talk to?

Yeah. So we generally take student volunteers from the University. And usually student volunteers from the bioscience field. So things like biology, or vet med, or ecology. And the best way to get in touch and see if you can volunteer is to email Charlie Robbins, or to check on our website and email the Bear Center.

So yeah, I mean, maybe just talk about volunteering a little bit and, sort of, like, the daily process of the bears, taking care of the bears, is we come in three times a day. So in the morning we do breakfast. And we feed the bears. And we clean their enclosure. And the volunteers help us with that.

And what do we generally feed the bears? That's one of the questions we get. Is they get bear chow, which is like a pellet, like a dog food, but made specifically for bears. And they get apples. And they get meat, generally, so salmon or other meats that are donated to us. Yeah.

So since our bears have moved, we could try and make it more interesting and move locations to where they are. I'm not sure how we feel about that.

We do have a question.

Sure.

We do have a question that just came in online right now. They want to know, do you know if there's been reports of grizzly sightings in the Pullman or Moscow area? Do we have bears in the wild around the Pullman and Moscow areas?

Yeah. We don't have grizzly bears, that I know of, here. That would be pretty shocking. But we do have black bears. And so I run and mountain bike on Moscow Mountain, and I've had friends that have run into black bears there, so there are black bears around.

OK. So we're back. And the bears are eating a few bear chow pellets that we've thrown out there for them, but they might also forage for us. This is one of our clover patches that we have in their exercise yard. There's a couple of clover patches distributed throughout, just because that's a really preferred food for them. It's high in protein, it's nutritious, and they know it so they'll chow down on it.

Oh, we can also see a bear on the play structure out there. That looks like Adak playing with some fire hose. So a big part of what we do here, besides the research, and the education, and the conservation, is keeping the bears happy. And so we actually have a full-time staff member-- that's the Bear Center manager. And he's here playing bear guard for me off-camera. Since we have this open, there is electric wire here that the bears know about, and they respect that. And we also have Brandon standing here with bear spray, so don't be too concerned.

But as I was mentioning, the Bear Center-- part of Brandon's job is to create enrichment for these guys. So he spends a ton of time creating bear-proof toys, which is really, really hard. I

remember when he first started and he was making his first couple rounds of toys, he spent a ton of time making them. And then we were here and we hung them up for the bears to play with, and within seconds they totally destroyed them.

So over the time that he's been here and making toys, they've gotten substantially more bear-proof. And fire hose is one of the most bear-proof things we have so we use it a lot. And he's actually woven it into hammocks. And the bears love to lay in hammocks. So a lot of enrichment. It's good because it keeps their mind occupied and it gives them something to do.

A lot of the enrichment is puzzles. And so they'll actually have a ball that they have to move into a certain position for the food reward to actually fall out. And so it keeps them interested. And they actually seem to look forward to it. It happens most days at noon, so if you happen to be on the Pullman campus you can stop by and try and catch enrichment happening.

I think we might have a question.

Yeah, talking about bear-proofing, do you ever have bears test camping equipment or anything like that for companies or anything?

Yeah. So we have in the past. If any of you are backpackers, then you're probably familiar with the bear cans that you have to carry in certain areas. And they're a plastic can with a lid that can only be opened in very specific ways, and it's usually a hard plastic. And so we have gotten a few of those, and we've put things in them, and put them out in the yard.

And as far as I remember, the bears couldn't get into them. But that's the only thing I've witnessed. I think there are some bear sacks, maybe, that people have asked us to test. But I haven't witnessed that. Yeah.

I guess I should mention, too, a lot of people lately have been asking me-- this is Willow. Yeah, this is Willow. And you can see she has a shaved patch on her shoulder. And so that's actually one of the studies I'm doing right now, looking at hair growth in bears. And it sounds pretty basic, but it actually hasn't been done before.

And so I'm shaving this patch of hair and measuring over the entire active season. So like, April through October, how much that hair grows each month. And that'll help biologists in the wild understand when they collect a hair sample from a wild bear, and they're inferring the diet from that hair sample, it will let them know that, OK, I have a hair sample and the hair grows this much over a month. Therefore, during this month, from this hair sample, it was eating this and the next month it was eating this.

OK. He's figured out how to kind of wave for food. He's been doing that on his own. He just started doing it. We didn't train him to wave. But if you see that--

He's training us.

Yeah. Well, that's the thing. So we do do a lot of training with the bears here. And it's really funny because they actually train you while you're trying to train them. So some of the things we've trained our bears to do are voluntary blood draws, which is really, really cool and really unique.

So actually, right now all of our 11 bears have been trained to do voluntary blood draws, even our bears that came from the wild. So over the last couple months we started training our bears that came from the wild how to come over to the fence. And they'll actually sit in front of us. And then we open up a little panel in the fence, and we ask them to stick out their hind foot.

And we're giving them honey, and we're giving them apple rewards. And then we're able to shave a little spot on the foot and find a vessel. And then we can use a really small needle and take a blood sample. And they don't even flinch. They allow us to take a blood sample.

And we can learn all sorts of things from these blood samples, from their diet, to their health, to their uptake of sugars, which is related to their insulin sensitivity, which is related to diabetes research. And so we can learn so much from these blood samples that the bears are voluntarily giving us. And it's so, so valuable. It's not something that you can get from wild bears.

Because when you actually anesthetize a bear, it can change some of those parameters. And so being able to collect blood samples from un-anesthetized bears, allows us to answer questions that nobody else can answer.

The hair patch study I mentioned also is looking at isotopes. So we're feeding a controlled diet and then we're measuring the hair. And because we know what the bear ate, and then we have its hair sample, we can get that correction factor again. Which we've previously gotten on blood, but it's really difficult to get with hair.

So to be able to develop that correction factor for hair is pretty cool. Because the more research that we can do with passive collection, and not actually having to dart animals, the better it is, in my opinion, because you can collect more data, you can avoid any potential harm to animals in the wild.

And so a lot of research right now is being done with barbed wire. And so researchers will string barbed wire in an area. And sometimes hang a lure above it, and then the bear will walk under or over the barbed wire, and it will just pluck out a little piece of hair as the bear walks through it. And then the researchers can analyze that hair for all sorts of things.

Some of the other stuff that we've helped researchers try and look at with the hair is that we're trying to figure out if you can tell if has gotten pregnant from looking at a hair sample. So we think that there's a lot more things we could learn. And we would like to help other researchers figure those things out with the bears that we have here. Yeah.

You talked about research in Alaska. What did your research in Alaska do to help you work with these bears?

Yeah. So I started my research with these bears during my masters, and then moved into a PhD where I'm studying bears in Katmai National Park. I don't know if our viewers have seen Brooks Falls. So Brooks Falls is in Katmai National Park and it's one of the most iconic bear viewing sites. It's a waterfall where the salmon jump up and over the falls, and the bears stand at the top of the falls and they catch the salmon in their mouths.

I don't work at Brooks, but I work in that National Park, but I work on the coast. And so the thing that I was working on was we were interested in how do bears use coastal environments, and what sorts of coastal habitats are important to bears, and what sorts of coastal food items are important to bears. We were also looking at bear conservation through how bear viewers might affect bears.

And so we thought that the potential for oil spills along the coast and changes to the marine environment, like ocean acidification, make looking at that interchange between the marine environment and the terrestrial environment really important. So how do bears rely on marine food resources? And how might those marine resources be changing?

And there's a lot going on in the ocean right now. And a lot of it's not really good. So it has potential to seriously impact bears. And so bears, in some ecosystems, their annual diet is mostly salmon. Bears in other ecosystems without access to salmon, like maybe Glacier National Park, those bears will consume a lot of vegetation. And that's something that I think a lot of people don't realize.

Even these bears here will go out into the yard and graze for hours, and hours, and hours. So bears in some places will eat 90% or more of their assimilated diets in vegetation. So I always like to tell people that, because people don't think of them as grazers, but they can be. Do we have--

Were any of the bears artificially inseminated?

I don't know of any of our bears being artificially inseminated. We don't get to breed bears here very often. Some of the most important research that we've done was related to reproduction. So we were able to do some research here that showed that female bears need at least 20% body fat in order to reproduce. And so that can allow researchers in the wild to go out and measure their bear's body fat and get an idea of how productive that population might be.

So if we do have the ability to have cubs here, they're usually produced naturally. So we have some males on-site, and we have females on-site, and we let them get to know each other and then we end up with cubs. We don't need to artificially inseminate.

How does the Center receive funding? And are there any works for maybe modernizing the facility?

We would love, love, love to modernize the facility and we're trying all the time to take steps towards doing that. Unfortunately, it's really, really expensive. So the estimated cost of the new facility that we'd like is \$25 million. And we currently don't have any major donors. So if anyone knows of anyone, the bears would benefit.

So right now, the bears are let out in, like I said, three different groups throughout the day. And because we only have one yard we can only let out one group at a time, which means that the other bears don't get to be out. And so with a new facility we could have multiple yards, which would mean that all of our bears could be out grazing and playing at the same time.

Yeah. A lot of the way that the Bear Center operates is through donations. So even some of the food-- a lot of their food-- is donated. And so it's a really, really valuable resource to have donors. Some of the funds also come from grants. And some of it, I believe, in the past, has come from the State or from the University. Various forms of funding.

So these guys out here grazing-- I mean, these guys were hand-raised, but this is how I feel like we do dispel some of the myths. I mean, I'm standing here with a couple strands of electric wire. And yeah, I raised them from cubs, so maybe it's unfair to say that they're more docile than you might expect.

But my research in Katmai National Park was in a really high density bear area. So I would camp in a tent for a month at a time, a couple times each summer, over four years. So I spent hundreds and hundreds of days camping right next to bears.

I was often woke up in my tent by the sound of a bear munching on wild celery outside my tent, just feet away from my head. I had an electric fence around my tent, believe me. I have a healthy respect for bears, very healthy.

But the fact that I was able to sleep and live in a tent, with no other protection besides bear spray, sometimes we carried a firearm as a precaution, but I was able to live with them for hundreds of days at really high densities-- 30 or 40 bears outside my tent within a small area. And so I firmly believe that it's nice to see bears like this where they're really just being bears and they're not trying to get you. Definitely not.

If and when a bear is a cub, is born here, does it just naturally stay here? Or do you try to relocate them then?

That's a really good question. Yeah. I should have mentioned. Yeah, so once a bear is here-- so we get bears, like I said earlier, we have bears that were born here and we have bears that came from the wild. The bears that came from the wild came because they were quote, "problem bears."

Hi Willow. Yeah, we're watching her. So quote, unquote, "problem bears" that were removed from the wild because they were a danger to humans, or a potential danger, and so those bears likely would have been euthanized, and instead came here. And once we have bears here, they live the rest of their lives here.

So being at the Bear Center, they get used to being around people and they get used to being fed by people. And that's the challenge, is if you have a bear that's been fed by people, that's food conditioned, and that can be really dangerous. And so they're really, really likely to continue to search out food from people. And so if we were to release our bears into the wild, there's such a high chance that they would get into trouble and then need to be euthanized, that it's just not an option.

And who is the lucky people, or person, that gets to name the bears?

Oh, yeah, good question. The last time we named bears was these guys. And we had all of the grad students and professors that are involved with the Bear Center-- we had everybody put names into-- I mean, it wasn't a drawing, we just had everyone suggest names and then we voted on it. And yeah, that's how we did it. We just voted.

Have you ever done research with bears that aren't grizzlies or black bears?

Yeah. I've done a little work with polar bears and I'll be doing a little more work with polar bears. And a lot of the research that we do here at the Center, even though we're working with grizzly bears, it applies to all of the bear species. So a lot of the energetics studies that we do with grizzly bears have been applied to polar bears, or applied to black bears.

And so because there aren't other facilities that do research, we're able to help out all the species with what we do.

Do we have any more questions? OK. Well, thanks for watching, everybody. I hope you enjoyed seeing the bears. And I hope we'll see you next time.